

Abstract

A lyophilizer system is adapted for operation in a first mode or a second mode with microwave assisted drying. The system includes a lyophilizing chamber, including shielding from microwaves. The chamber is connected to a pressure controller for controlling vacuum in the lyophilizing chamber and a device for trapping water vapor. One or more microwave generators, direct microwaves into the lyophilizing chamber. Refrigeration units lower the temperature of the lyophilizing chamber and condenser. The chamber environment maintains a temperature and a pressure that facilitates sublimation in the chamber in a first mode, and for creating a chamber environment having vacuum and temperature such that when combined with microwaves directed into the chamber, facilitates sublimation in the chamber in a second mode. The chamber has arc inhibiting surfaces and shielding and a corona discharge detection and control system, including optical, thermal and other detection systems.